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Which factors before discharge have to be considered to prevent readmissions?

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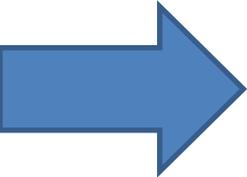
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Aims

pre-discharge predictors:



all the ones which referred to the admission period until discharge (including the discharge phase) or to the period before index admission.

- ✓ Systematic review to describe **pre-discharge predictors** of readmission after discharge from psychiatric or general health in-patient care with a psychiatric diagnosis.
- ✓ Analysis of the relationship between pre-discharge variables available for Italy and psychiatric and medical readmission.



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Background

- ✓ A substantial proportion of psychiatric inpatients are being readmitted after discharge.
- ✓ Readmissions are disruptive for psychiatric patients and their families; contribute to rising costs of mental health care and readmission rate is a commonly used indicator of the quality of care.
- ✓ Among pre-discharge factors, the role of inpatient care has not been frequently assessed, with the exception of **LoS**.
- ✓ In the pre-discharge period an extensive number of **patient-based factors**, such as clinical and socio-demographic variables, have been examined as possible predictors of readmission.



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Review: Methods

Comprehensive literature searches were conducted in the following electronic bibliographic databases: Ovid Medline, PsycINFO, ProQuest Health Management and OpenGrey. In addition, Google Scholar was utilized.

Relevant publications published between January 1990 and June 2014 were included.

Included:

- ✓ Studies on the association between pre-discharge variables and inpatient readmission after discharge were considered;
- ✓ Patients 18+ years old and with a main psychiatric diagnosis;
- ✓ Quantitative studies with some quantitative measures of association;
- ✓ Papers published in English, German, Spanish, Italian or French.

Excluded:

- ✓ The interest of the review is on **the risk of being readmitted**, for this reason papers reporting only analyses on other kinds of outcomes, even if connected to readmission (i.e. related to time to readmission or cumulative Los or number/frequency of readmissions) were excluded.

Review: characteristics of included studies/ 1

734 unique articles identified

- 313 excluded in the first stage after the screening of abstracts
- 300 excluded checking the full text of the papers

121 remaining papers:

- 14 had only outcomes related to cumulative LoS, frequency or intensity of readmissions
- 49 only related to time to readmission

→ 58 included

- ❑ 7 case-control, 5 intervention studies, 46 cohort studies.
- ❑ Published between **1990 to 2014**.
- ❑ The majority conducted in **USA** (62%).
- ❑ **Methodology:** comparison between readmitted versus not readmitted is typically performed.
- ❑ **Follow-up period:** a medium time-spell (between 1 month and 1 year) in around two third of cases, with 8 papers with short (up to 30 days) and 12 with long (more than 1 year) follow-up time.

Review: characteristics of included studies/2

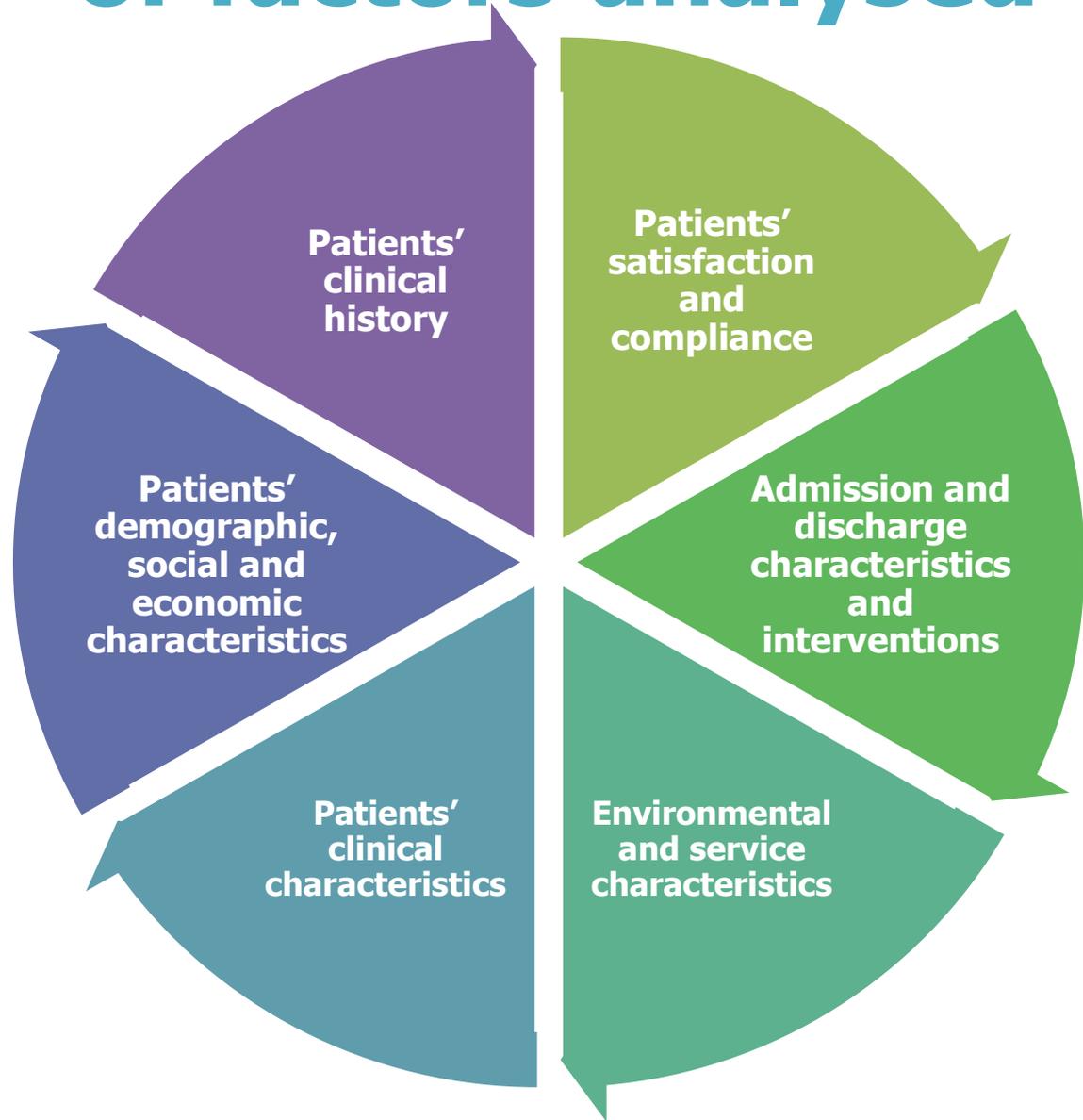
- ✓ Most of studies used multivariate regression methods, so analyses on conditional associations between pre-discharge factors and readmission possible.
- ✓ Only about $\frac{1}{4}$ of papers are representative of the whole psychiatric population (in the majority of cases, the reason for non-representativeness is consideration of diagnostic subgroups only, e.g.: only patients with schizophrenic disorders).
- ✓ Variables related to previous admission history were the strongest predictors of hospitalization, but only around 60% adjusted for past hospitalizations.



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Review: categories of factors analysed

Categories pre-discharge variables analysed:





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Review: main results for each group of factors

Patients' demographic, social and economic characteristics	Nonsignificance in most of cases, but, among significant papers: older age, being employed, being married and higher educational level protective factors, while receiving social welfare benefits risk factor
Patients' clinical characteristics	Psychiatric and substance abuse/dependence diagnosis comorbidity risk factor, higher functioning, prognosis or quality of life at discharge protective factors
Patients' clinical history	Previous admissions is the factor most often analyzed and found as associated with readmission; also previous health service in general risk factor
Patients' attitude and perception	Positive attitude toward medication protective factor
Environmental, social and hospital factors	Social support protective factor
Admission and discharge characteristics	Length of stay, discharge on medical advice and involuntary admission, when significant, usually protective factor in multivariate analysis; complications during hospitalization risk factor



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Review: Limitations

- ✓ Associations are in most cases not straightforward, and in many cases statistical significance is only found at bivariate level;
- ✓ low representativeness of the included papers; moreover, different psychiatric populations in different historical periods, from different countries, types of inpatient services and mental health systems make results difficult to summarize;
- ✓ results only regard the outcome “readmission or not” and not other outcomes on readmission (like “time to readmission”).



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Review: Conclusion

- ✓ A wide range of studies on the association between pre-discharge variables and readmission emerged:
 - ✓ a lot of sociodemographic and clinical characteristics of the patients studied, while less variables analysed as regard admission characteristics, clinical events or treatment at pre discharge level and in particular during admission;
 - ✓ Many variables were analyzed and found significant, but some of them were analyzed in very few papers (only 1 in some cases).
- ✓ Some consistent predictors of readmission rates emerged:
 - ✓ The existence or the number of previous admission were the most consistent predictors of readmission rates, only in few cases resulting not significantly associated to readmission; previous use of health service in general turned out as a risk factor;
 - ✓ Sociodemographic factors: Older age, being married or, with weak results, being employed or with higher educational level protective factors; presence of benefits or disability pension risk factors toward readmission;
 - ✓ Clinical factors: Measures of functioning/prognosis/quality of life at discharge protective factors; further analysis for specific subgroups required for length of stay, turning out as a protective factor in some multivariate analysis.



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The Italian setting /Introduction

- ✓ 63,419 psychiatric discharges in year 2012 from 343 different hospitals, with a yearly readmission rate of 43%. Among readmitted, 50% were rehospitalized within 90 days.
- ✓ Balanced distribution of gender (51% of female patients); age: almost half of patients (47%) aged 18-44, while elderly (65+) represent 12% of the total patient population.
- ✓ Most common diagnoses: F2-schizophrenia (38%), F30-31 bipolar disorder (22%), F32-39 depression (21%).
- ✓ Half of patients had a length of stay between 1 and 10 days, 29% over 15 days while less than 8% had a LoS longer than 1 month.



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Public vs Private hospitals: main differences

- ✓ 314 public and 29 private hospitals; 88% of all index discharges recorded in public hospitals. Difference in 1-year readmission rate between public and private hospitals not significant but shorter time to readmission in public (median 86, mean 117.3 days) than private (median 119, mean 140.0 days) hospitals.
- ✓ Psychotic diagnoses much more common in public (62%) than in private (47%) hospitals, mainly due to the highly different share of schizophrenic patients (40% for public vs 23% for private hospitals).
- ✓ Most common values of length of stay (LoS; around 30% of instances in both cases): 6-10 days for public (median 10 days, mean 13.2 days) and 11-15 days for private (median 15 days, mean 20.2 days) hospitals.

Association between pre-discharge factors and readmission

Readmission vs not

	30 days	60 days	90 days	180 days	365 days
Female	<risk*	<risk	<risk	<risk	NS
Older age	<risk	<risk	<risk	NS	>risk
Longer LoS	<risk	<risk	<risk	NS	NS
Psychotic diagnosis	NS	>risk	>risk	>risk	>risk

*bivariate analyses only

- ✓ Age above median turned out as protective towards readmission up to 90 days, while a risk factor for 1-year readmission.
- ✓ Higher risk for: male patients (up to 180 days) and lower LoS (up to 90 days), psychotic patients (from readmission at 60-days onward).

Association between pre-discharge factors and type of readmission

Psychiatric vs non-psychiatric readmission

	30 days	60 days	90 days	180 days	365 days
Female	NS	NS	medical*	medical*	medical*
Older age	medical	medical	medical	medical	medical
Longer LoS	psychiatric**	psychiatric	psychiatric	psychiatric	psychiatric
Psychotic diagnosis	psychiatric	psychiatric	psychiatric	psychiatric	psychiatric

*bivariate analyses only

** multivariate analyses only

- ✓ For late readmitted, being female is associated with medical readmission, but only at bivariate level.
- ✓ Longer LoS, younger age and psychotic diagnosis associated with psychiatric readmission for all the follow-up periods considered.



Other pre-discharge factors available in the Italian dataset

- ✓ Protective factors towards readmission: being foreigner or stateless, being married, involuntary admission, highest education (high-school or academic degree).
- ✓ Risk factors towards readmission: discharge against medical advise, intermediate (lower secondary) level of education.
- ✓ Among readmitted, higher likelihood of psychiatric readmission for: being foreigner or stateless (up to 180 days), single, discharge against medical advise, involuntarily admitted, lowest education.



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Conclusion

Some limitations have to be considered:

- ✓ Analysis of Italian data does not include previous admissions (i.e. the most relevant predictor of readmission in the literature) and different results between bivariate and multivariate analyses highlight the set of possible predictors to consider is critical for the final set of significant results.
- ✓ Heterogeneity of findings suggest that association between readmission and variables as length of stay, age and gender may strongly depend on the definition of readmission (i.e. time to follow up and whether also medical or only psychiatric rehospitalisations are included).

Comparison with findings from the literature:

- ✓ Differences: Female gender protective and psychotic diagnosis risk factors, mixed results for age and educational level.
- ✓ Similarities: Mildly protective role of LoS, being married and involuntary admission protective factors, discharge against medical advise risk factors.